



CONCRETE CONTINUOUS BEAM

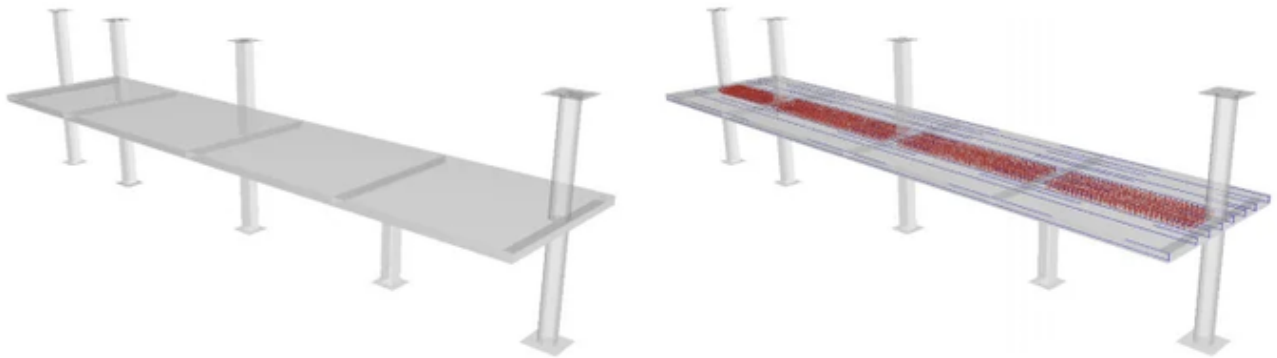
ANALYSIS AND DESIGN OF REINFORCED CONCRETE CONTINUOUS BEAMS AND SLABS

ANALYSIS | DESIGN | DETAILING | C01

Summary

Design single and multi-span reinforced concrete beams and slabs, with rectangular, T, L, or I shaped, and inverted T and L-sections, as well as tapered sections. You can analyse sub-frames and the module automates the pattern loading of dead and live loads at ultimate limit state.

Continuous Beam allows redistribution of moments and shear to a user specified percentage. This module can be used on its own or as a post-processor for Sumo. Generate complete bending schedules for beams and slabs.



What makes this module special?

- Automated pattern loading
- Post-processing from Sumo
- Crack width calculations
- Generate complete bending schedules

Detailed Description

Continuous Beam allows you to easily design multi-span reinforced concrete beams and slabs. Spans can be supported with or without rotational restraints, i.e., columns above and below. Sections that can be defined are rectangular, T, L, or I shaped, as well as inverted T and L-sections. Sections can be tapered along the span of the beam.

The module can analyse sub-frames (including columns) and automates the pattern loading of dead and live loads. At ultimate limit state, moments and shears can be redistributed to a user specified percentage. Both short-term (elastic) and long-term



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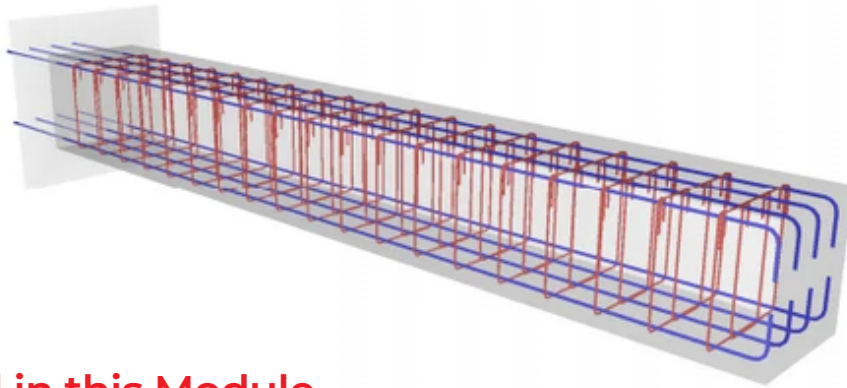
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deflections are calculated. The long-term deflection calculations consider concrete cracking, shrinkage, and creep. For beams and one-way spanning slabs, you can manipulate long-term deflections by editing the steel reinforcement.

Continuous Beam can save a lot of time by conveniently using the module on its own or as a post-processor for Sumo. Using the Design Links, you can import beams complete with geometry, moment, and shear force envelopes for detailed design and reinforcement detailing.

After the analysis you can generate complete bending schedules for beams and slabs. A 3D picture helps you position the bars accurately and identify any possible conflicts.

The module automatically adjusts the reinforcement detailing rules according to the mode selected, e.g., beam or column strip of a flat slab. Using the rebar editor, it is easy to modify the main and shear reinforcement - diagrams display the entered reinforcement together with the required amounts at ULS and minimum amounts required by the design code. You can open the generated bending schedules in Padds or Probar 2D for final editing and printing.



Theory used in this Module

Entered dead and live loads are automatically applied as pattern loads during the analysis. At ultimate limit state, moments and shear are redistributed to a specified percentage. The module constructs a 2D frame model of the beam/slab and any specified columns. It performs analyses at SLS and ULS:

It uses the gross uncracked concrete sections in the analysis; separate adjustments are made for cracking in the assessment for long-term deflections.

The module can redistribute bending moments at ultimate limit state. It does this by adjusting the support moments downward with the specified percentage. If you set the method of moment redistribution is set to optimised, the module will further minimise



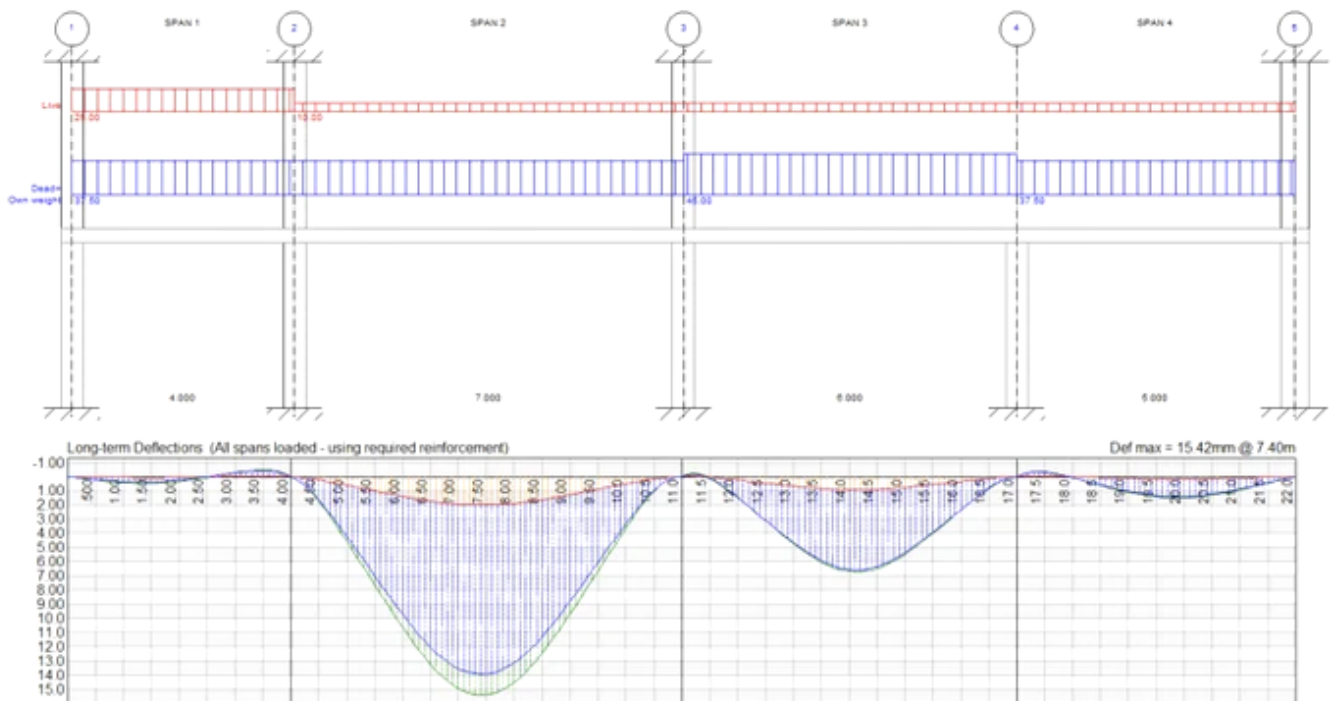
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the design moments by redistributing the sagging span moments upward as well. Shear forces are adjusted appropriately to maintain equilibrium.

The various design codes follow similar proportions for dividing flat slabs into column and middle strips. The module follows a rational approach by using the column and middle strip proportions specified in BS 8110 - 1997, and then adjusting the strips widths to simplify reinforcement detailing.



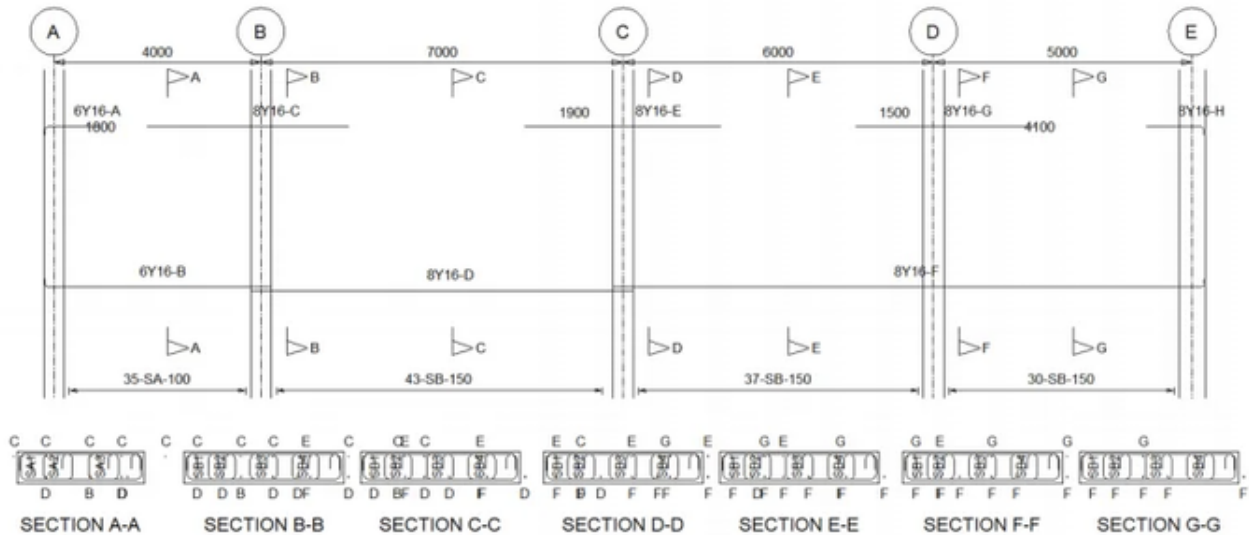
Continuous Beam calculates elastic (short-term) and long-term deflections. In both cases, it uses the SLS loading with no moment redistribution. Adjustments are made for concrete cracking in the long-term deflection calculation.



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Workflow

You can either create your beam in the module or use the Design Links in **Sumo** to send data from your structural model to **Continuous Beam**.

Features

- Automated pattern loading
- Long-term deflection calculations
- Post-processing from Sumo
- Generate complete sending schedules

Supported Codes

Design Codes

- | | | | |
|------------------|------------------|-----------------------|----------------------|
| • ACI 318 - 1999 | • AS3600 -2001 | • CP65 - 1999 | • HK Concrete - 2013 |
| • ACI318 - 2005 | • AS3600 - 2009 | • CSA-A23.3:2019 | • IS:456 - 2000 |
| • ACI 318 - 2011 | • AS3600 - 2018 | • CSA-A23.3-04 - 2010 | • NZ 310 1- 2006 |
| • ACI 318 - 2014 | • BS8 110 - 1985 | • Eurocode 2 -2004 | • SABS 0 100 - 2000 |
| • ACI 318 - 2019 | • BS8 110 - 1997 | • HK Concrete - 2004 | • SP 63.13330.2018 |